17 Hatidhar st. Ra'anana
43665, Israel
Fax: 09-7417422
Tel: 09-7417411

www.adcom.co.il

UDEC-1

Universal Debug Center

User Manual & Quick Start

UM-004708

Revision A

Version	Issued By	Issue Date	Comments
1.0	Eli Moshe	20.9.2012	New Product
1.1	Yoav Katz	2.12.2012	Updated GUI
1.2	Yoav Katz	17.01.2013	Upgrade current limit

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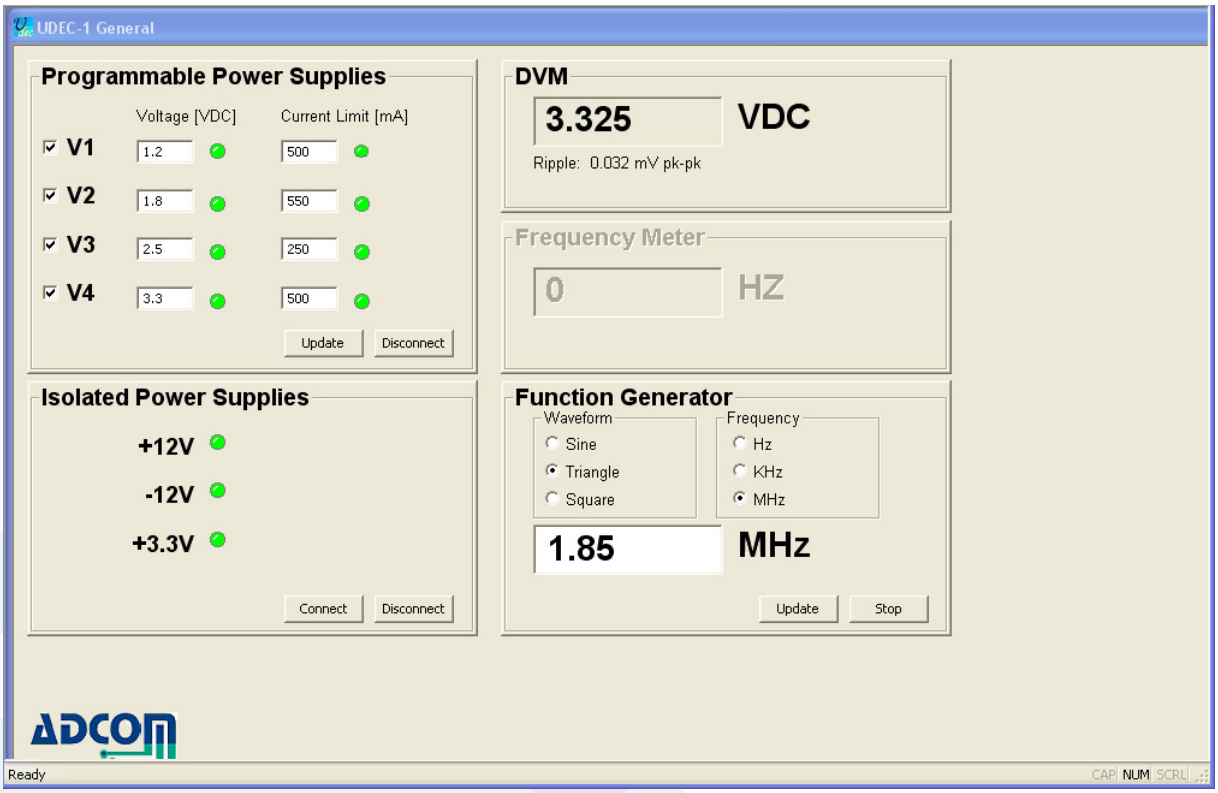
Quick Start

First Step

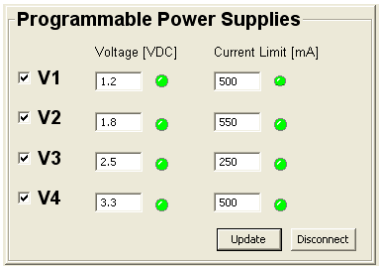
Insert the CD into a PC drive and run **UDEC-1 Ver x.xx.msi** to install the UDEC-1 driver. Once completed the UDEC-1 ICON residing on your desktop like:

Click on the icon to activate UDEC-1.
You will get the below screen.



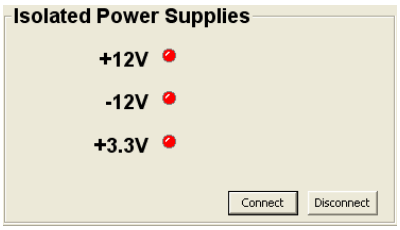
Programmable Power Supplies (PPS)

All 4 PPS are connected to a common return (GND).
Total power of the 4 PPS cannot exceed 10W.
The UDEC-1 control software alerts for any excess of Power and disable the option of update the PPS.



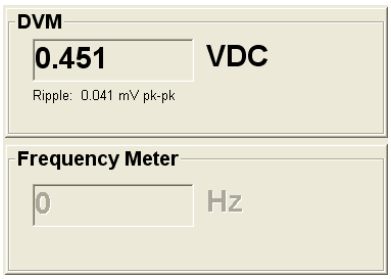
2.1 Isolated Power Supplies (IPS)

The +12VDC and -12VDC supplies up to 330mA and share a common return which is isolated from all other returns.
The 3.3VDC supplies up to 500mA
and it's return is isolated from all other returns.
The IPS is controlled from the GUI.



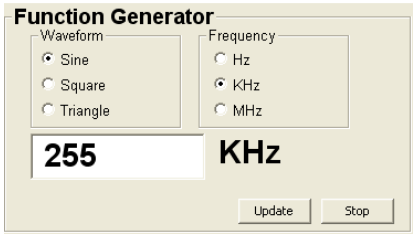
DVM and Frequency Meter

UDEC-1 DVM and Frequency Meter share the same input probe. They also share the same return with the PPS. Use the ***Meter IN*** BNC on the Front Panel to connect the DVM/Frequency Meter Probe. Select the required measurement by cliking the relevant function window.



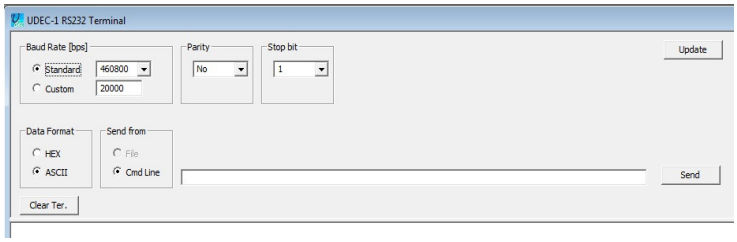
Function Generator

UDEC-1 Function Generator creates Sine, Triangle and Square waveforms.
The waveform is available at the ***Wave Out*** BNC on the Front Panel.
Sine and Triangle amplitude is ~1.8V±0.1V.
Square wave amplitude is ~10V±0.5V.



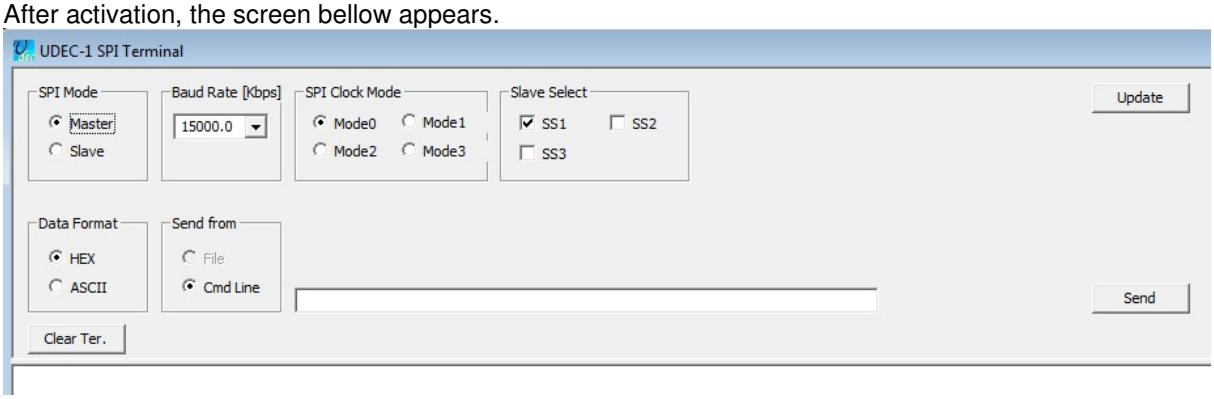
Serial Communication Interfaces

RS232, UART, RS422, RS485
After activation, the following screen appears. Select the required protocol, format and data source and you can start Transmit and Receive data from the other device.



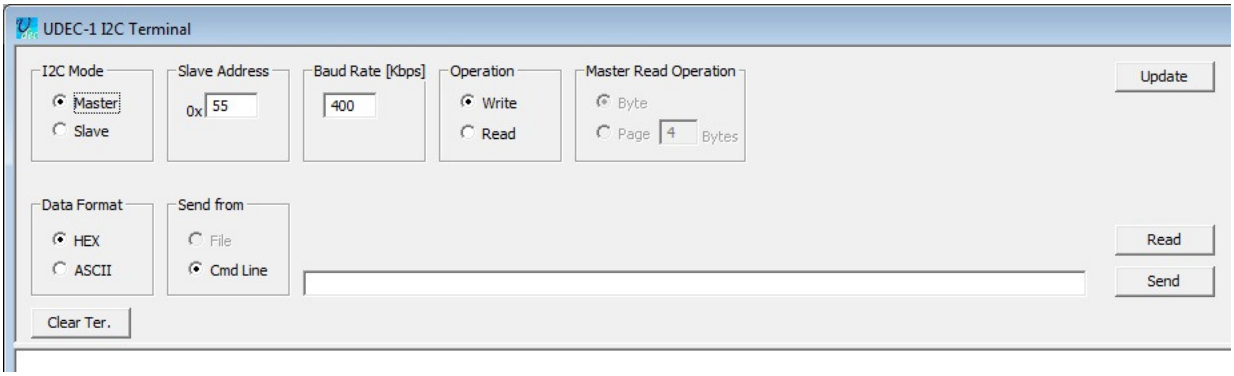
SPI

UDEC-1 can act as Master or Slave device at maximum speed of 15Mbps.
After activation, the screen bellow appears.

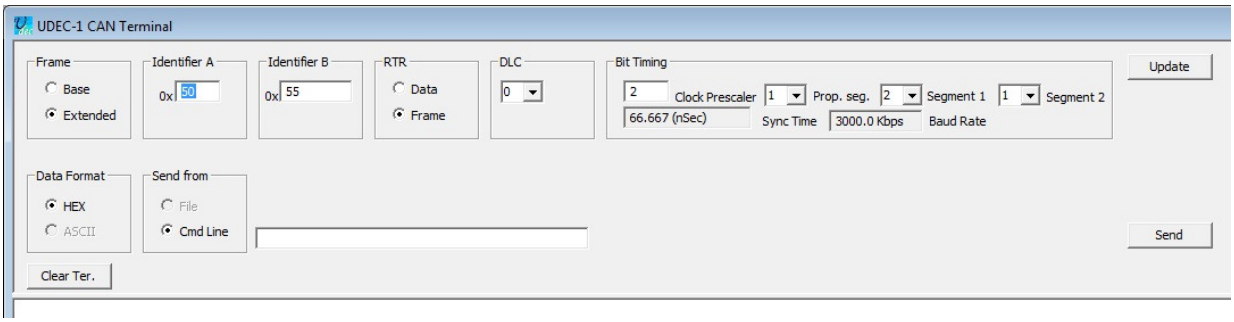


I²C

After activation, the screen bellow appears
UDEC-1 can be either Master or Slave



CAN
Communication protocol may be different with different devices. All protocol share 11 or 29 bytes for Identifier and 0÷8 bytes of message.
UDEC-1 GUI enables inserting protocol variables to acomodate most of the devices.
After activation, the screen bellow appears.



End of Quick Start

User Manual

1. Introduction

1.1 Purpose

The purpose of this document is to guide the user through the functional usage of the UDEC-1.

1.2 Scope

The Universal Debug Embedded Center - UDEC-1- serves as a debug and validation tool for every engineer and technician in the electronic lab.
The UDEC-1 is also a production floor tool for on board programming and control of devices
UDEC-1 supports In System Programming (ISP) and debugging utilizing UART, RS232/422/485, SPI, CAN or I²C bus.
User friendly GUI enables navigating between the UDEC-1 features

1.3 What's in the Box?

UDEC-1 box contains the following:
The UDEC-1
12VDC/2A Wall Mount Power supply
USB cable
CD with the UDEC-1 utility software and User Manual

1.4 First Steps

Insert the CD into a PC drive and run **Installation (**see Appendix A)
Connect the PS to the Power Jack at the rear side of the box and turn power *ON*.
Connect the USB cable between the UDEC-1 and the PC USB input.
An audio tone acknowledges that the UDEC-1 is connected and ready for use.

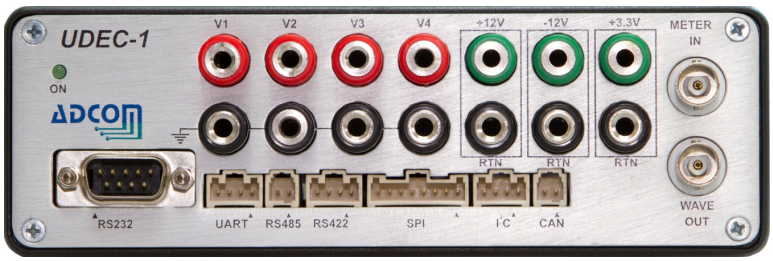
1.5 UDEC-1 Features

UDEC-1 supports the following features:

4 Programmable Power Supplies 0.8-5.3VDC/1A each
Isolated fixed +/-12VDC/330mA Power Supply
Isolated fixed 3.3VDC/500mA Power Supply
DVM – 0÷45V
Frequency Meter - 0÷10MHz
Function Generator – 0÷2MHz

Interfaces:
RS232
RS485
RS422
UART
SPI
I²C
CAN
The paragraphs below describe how to use each of the UDEC-1 features.

UDEC-1 Front Panel

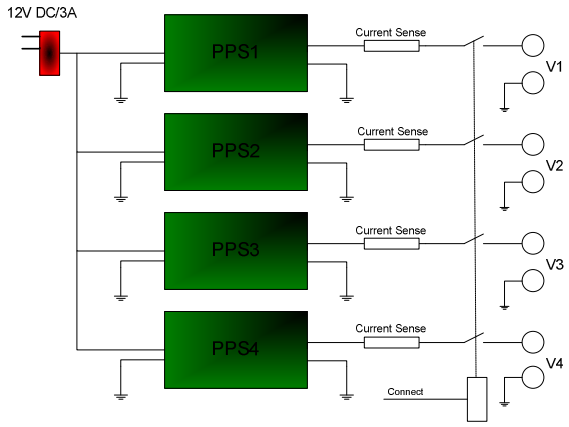


UDEC-1 Back Panel

2. Using the UDEC-1

2.1 Programmable Power Supplies (PPS)

There are 4 programmable power supplies in the range of 0.8-5.3VDC/1A.



All 4 PPS are connected to a common return (GND).
Total power supplied by all PPS 10W
Voltage programmable 0.8÷ 5.3VDC
Current programmable 100÷ 1A

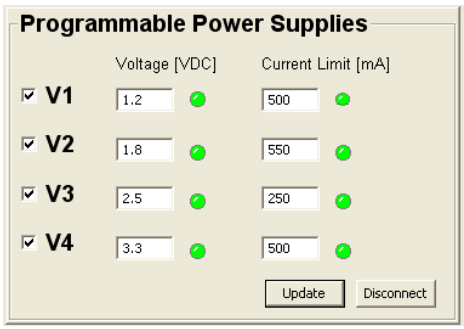
If current exceeds the limit in any one of the PPS by 5%, all 4 PPS are disconnected.
If voltage exceeds the limit in any one of the PPS by 5%, all 4 PPS are disconnected.
The PPS that exceeds its limit is displayed by Blinking Red LED on the GUI.
All other PPS LEDS blink Green.

Total power supplied by the 4 PPS cannot exceed 10W.
The control software alerts for any excess of power and disconnects all 4 PPS.

To activate an output – Fill the check box of the PPS and key-in the required voltage and current limit.

Press Update to output the programmed voltage to the output Banana.

Press Disconnect to disconnect all 4 PPS from their outputs.



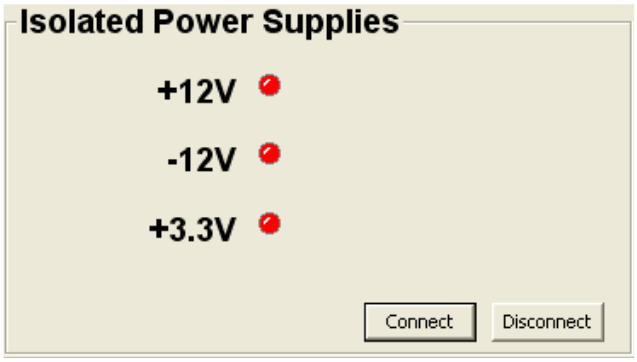
2.2 Isolated Power Supplies (IPS)

There are 3 isolated fixed Power Supplies (IPS).
The +12VDC and -12VDC share common return which is isolated from PPS ground return.
The ±12VDC supplies up to 330mA from each output.

The 3.3VDC return is isolated from all other returns. The 3.3VDC supplies up to 500mA.

If maximum current exceeds its limit, the IPS will be disconnected and it's LED will turn RED.

The IPS is controlled from the GUI.



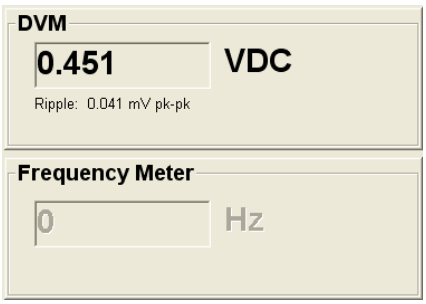
Press to connect all IPS to their output bananas.

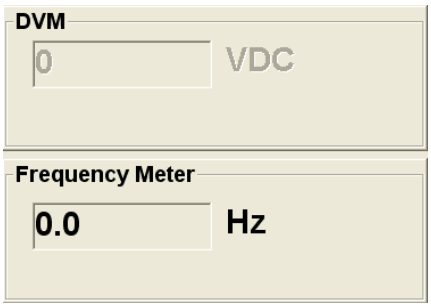
Press to disconnect all IPS from their output bananas.

2.3 DVM and Frequency Meter

UDEC-1 DVM and Frequency Meter share the same input probe.
The probe is a standard 1:1 Scope probe.
They also share same ground return with the PPS.
Use the *Meter IN* BNC on the Front Panel to connect the DVM/Frequency Meter Probe.

Select the required measurement by pressing the function window.
If *DVM* function is selected, the *Frequency Meter* function is Grayed Out and is Inactive as seen below. If *Frequency Meter* function is selected, the *DVM* function is Grayed Out and is Inactive.





Voltage measurement range: 0÷45VDC
Resolution: ±1%.
Input impedance: 5MΩ
The user can save the measured values vs. time in a log file for further analysis.

Frequency measurement range: 0÷10MHz
Measurement threshold: 200mV
Measurement accuracy: ±0.1%

2.4 Function Generator

UDEC-1 Function Generator creates Sine, Triangle and Square waveforms.
The waveform is available at the *Wave Out* BNC on the Front Panel.

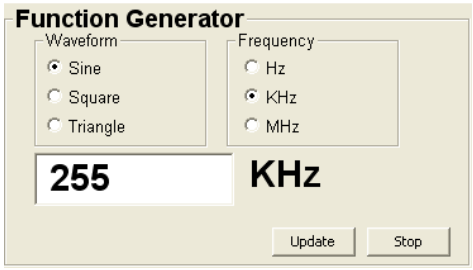
From the GUI select the Waveform and Frequency required.

Press

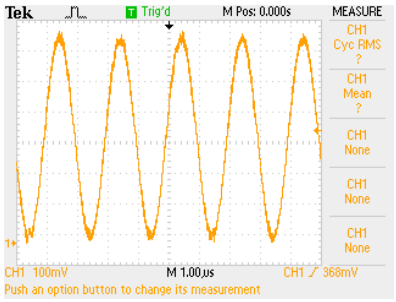
to output the waveform to the BNC.

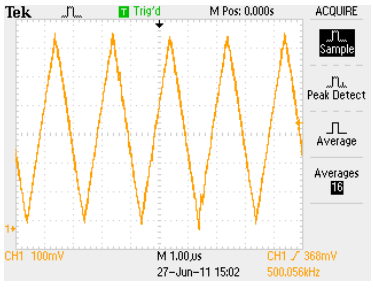
Press

to stop the waveform generation.



Synthesizer resolution: 28 bit (~0.1Hz)
Output DAC resolution: 10 bit
Sine and Triangle amplitude is 1.8V±0.1V.
Square wave amplitude is 10V±0.5V.
Sample of waveforms outputs snapshots are shown below.





2.5 Serial Communication Interfaces

2.5.1 RS232

Toolbar activation Icon:

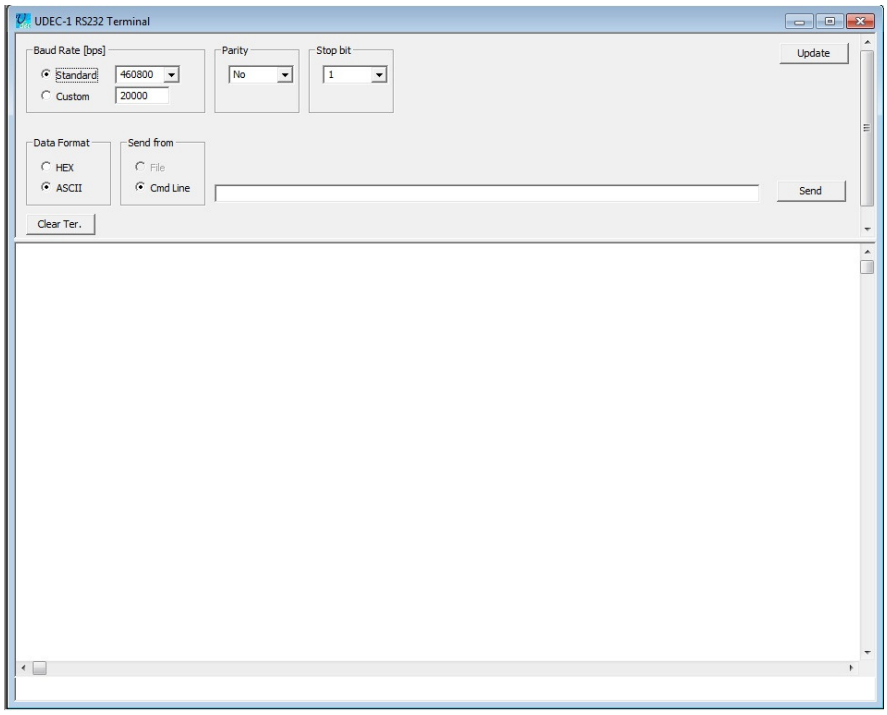
RS232 connector is male connector with Pin 1 at the upper left corner.

Connector Pins

1. NC
2. RX (Input from other device)
3. TX (Output to other device)
4. NC
5. GND
6. NC
7. NC
8. NC
9. NC

NC - Not Connected
RS232 maximum speed is 921600bps.
Standard speed can be selected from the pull-down menu.
Non-standard speed can be selected in *Custom* mode

Note: Connector body is connected to GND.
After activation, the screen bellow appears.
Select the required protocol, format and data source and you can start Transmit/Receive data from the other device.

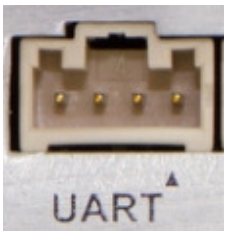


2.5.2 UART

Toolbar activation Icon:

UART connector is a 4 pin male header with Pin 1 at the right corner.

Connector Pins

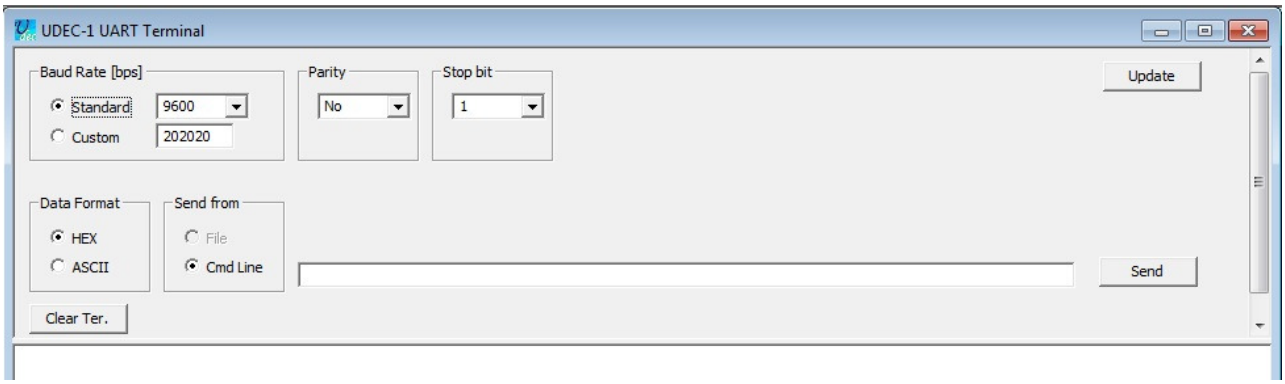


1. VREF Input
2. RX (Input from other device)
3. TX (Output to other device)
4. GND

VREF input defines V_{OH}/V_{IH} level required.
VREF accepts external power 3.3÷5.5VDC.
If VREF is left *OPEN*, I/O levels are LVCMOS

UART maximum speed is 3Mbps.
Standard speed can be selected from the pull-down menu.
Non-standard or higher speed can be selected in *Custom* mode

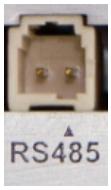
After activation, the screen bellow appears.
Select the required protocol, format and data source and you can start Transmit/Receive data to/from the other device.



2.5.3 RS485

Toolbar activation Icon:

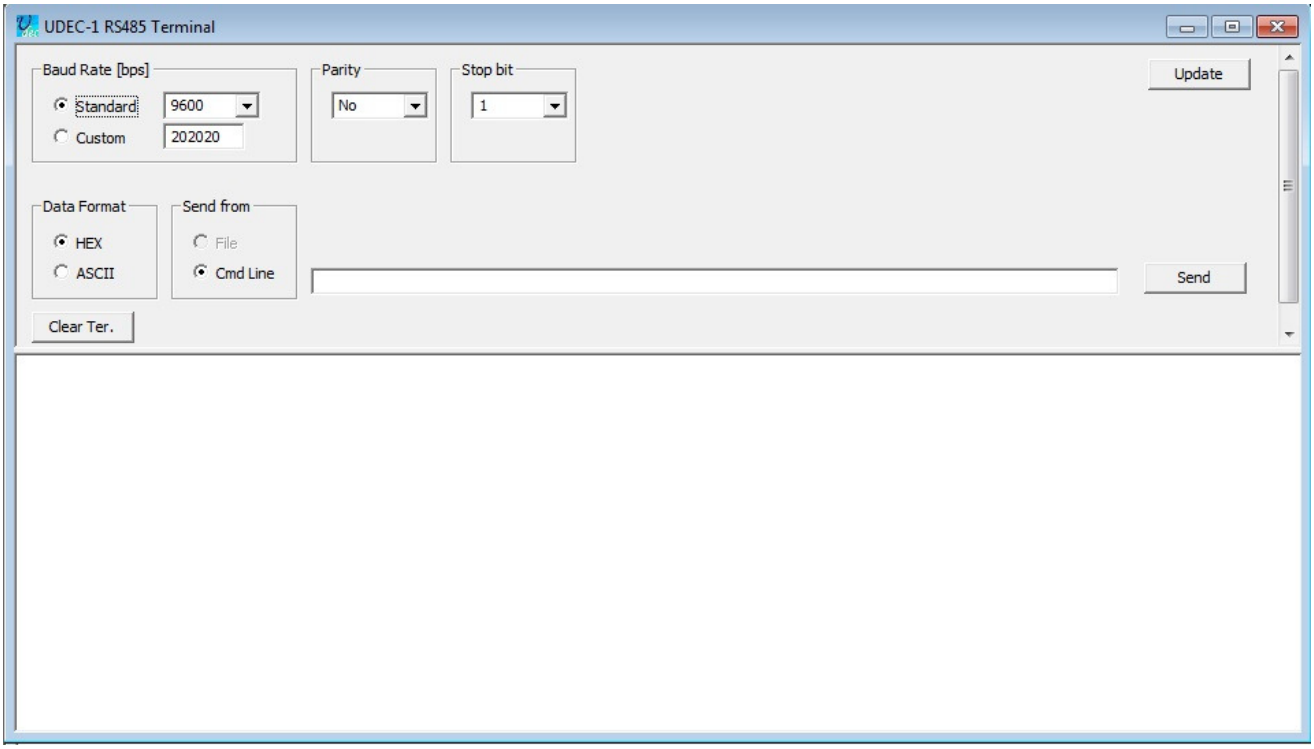
RS485 connector is a 2 pin male header with Pin 1 at the right corner.



Connector Pins
1. RS485 - B
2. RS485 – A

120Ω termination exists between pins A and B.
RS485 maximum speed is 3Mbps.
Standard speed can be selected from the pull-down menu.
Non-standard or higher speed can be selected in *Custom* mode

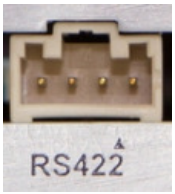
After activation, the screen bellow appears.
Select the required protocol, format and data source and you can start Transmit/Receive data to/from the other device.



2.5.4 RS422

Toolbar activation Icon:

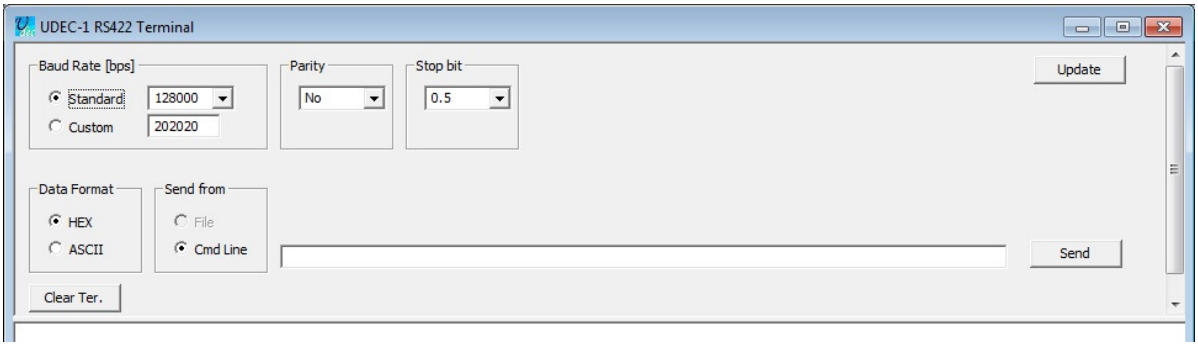
RS422 connector is a 4 pin male header with Pin 1 at the right corner.



Connector Pins
1. RS422 RXA
2. RS422 RXB
3. RS422 TXZ
4. RS422 TXY

120Ω termination exists between pins RXA and RXB.
RS422 maximum speed is 3Mbps.
Standard speed can be selected from the pull-down menu.
Non-standard or higher speed can be selected in *Custom* mode

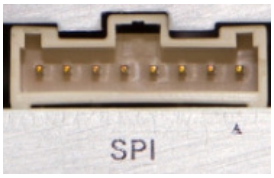
After activation, the screen bellow appears.
Select the required protocol, format and data source and you can start Transmit/Receive data to/from the other device.



2.5.5 SPI

Toolbar activation Icon:

SPI connector is male 8 pin header with Pin 1 at the right corner.
There are 3 SS pins (Slave Select) that enable connection to 3 SPI slave devices.
The UDEC-1 can act as Master or Slave device.
When UDEC-1 is a Slave, SS1 acts as the SS of the UDEC-1.

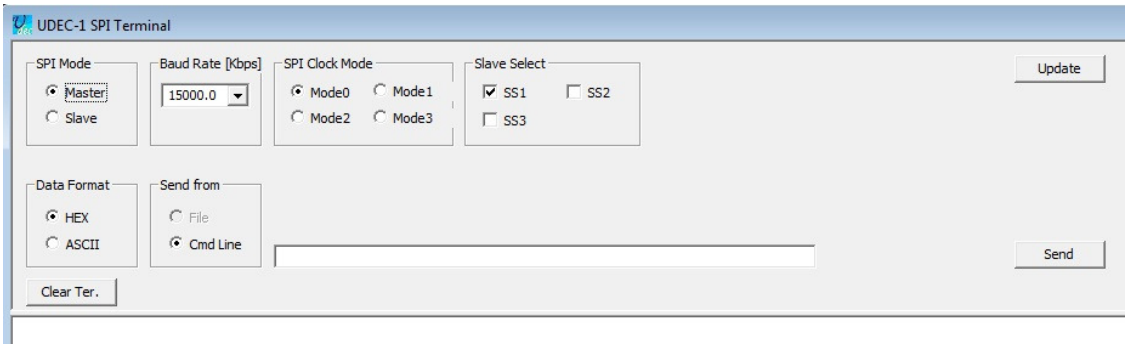


Connector Pins
1. VREF
2. SS3
3. SS2
4. SS1
5. SCK
6. MISO
7. MOSI
8. GND

VREF input defines V_{OH}/V_{IH} level required.
VREF accepts external power 3.3÷5.5VDC.
If VREF is left *OPEN*, I/O levels are LVCMOS.
SPI maximum speed is 15Mbps.
Standard speed can be selected from the pull-down menu.
Non-standard or higher speed can be selected in *Custom* mode

After activation, the screen bellow appears.

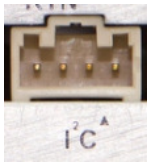
Select SPI Mode – Master/Slave.
Mode Master – required Baud rate, SPI Clock Mode, Slave Select and Data Format.
Mode Slave – only SPI Clock Mode and Data Format are required.



2.5.6 I²C

Toolbar activation Icon:

I²C connector is male 4 pin header with Pin 1 at the right corner.



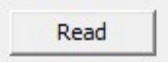
Connector Pins
1. VREF
2. SDA
3. SCL
4. GND

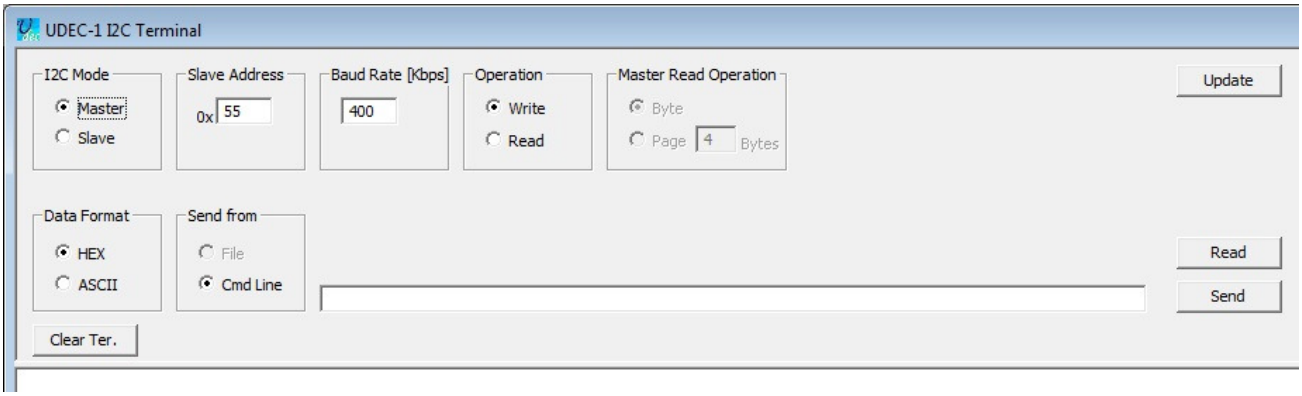
VREF input defines VOH/VIH level required.
VREF accepts external power 3.3÷5.5VDC.
If VREF is left *OPEN*, I/O levels are LVCMOS.

After activation, the screen bellow appears
UDEC-1 can be either Master or Slave
You may select the Slave address.
The maximum speed is 400Kbps
You may select the operation for read/write.
In master read operation you may select the data size to read:

- Byte – one Byte in a transmission.
- Page – number of bytes according the amount parameter.

You may select Data Format either Hex or Ascii

After filling the required parameters in the screen you can start Transmit (Write oeration) data or Receive (Read operation) data by clicking the read button 



2.5.7 CAN

Toolbar activation Icon:

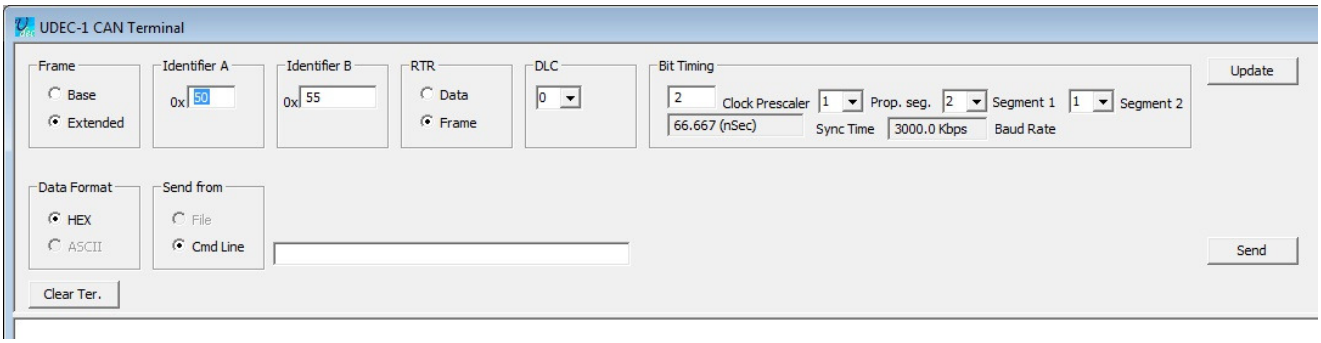
CAN connector is male 2 pin header with Pin 1 at the right corner.

Connector Pins
1. CAN-Hi
2. CAN-Lo

120Ω termination exists between pins CAN-Hi and CAN-Lo
CAN bus maximum speed is 1Mbps.
Communication protocol is based on BOSCH CAN bus protocol. Although it may be different with different devices. All protocol share 11 or 29 bytes for Identifier and 0÷8 bytes of message.
UDEC-1 GUI enables inserting protocol variables to acomodate most of the devices.

After activation, the screen bellow appears.

Select the CAN protocol and you can start Transmit/Receive data to/from the other device



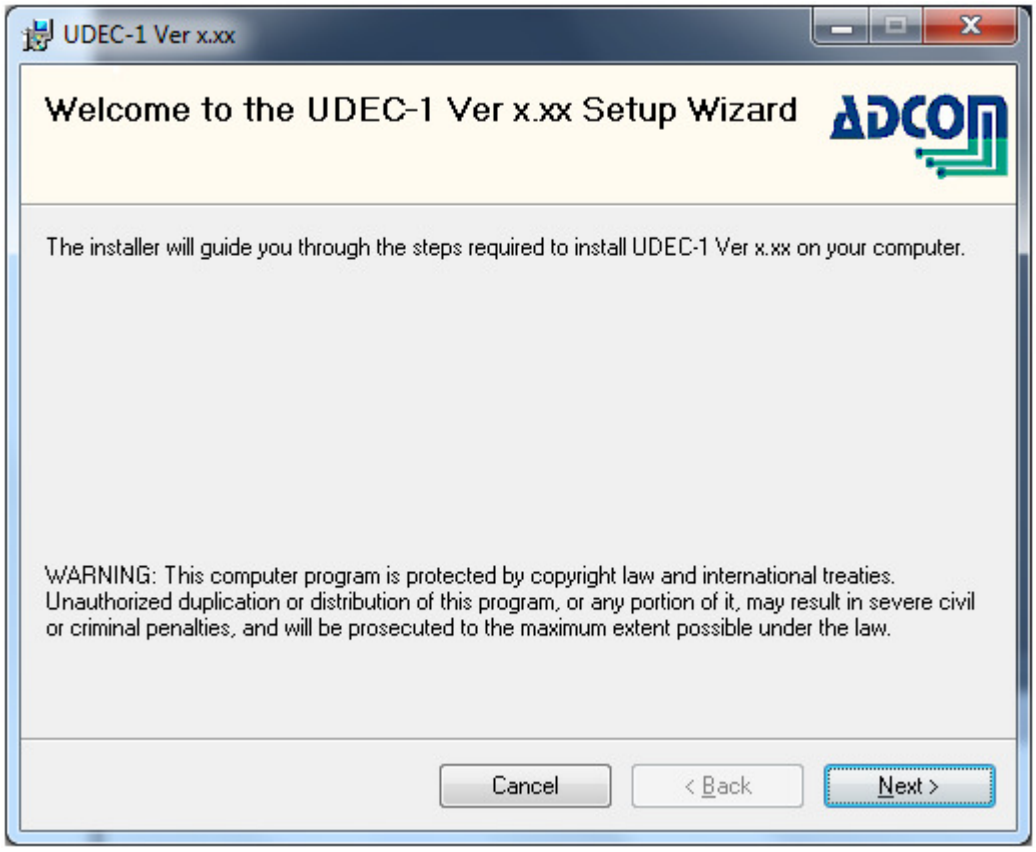
Appendix A

Setup USB driver for windows 7, Vista, XP

Step 1: UDEC-1 Utility Installation

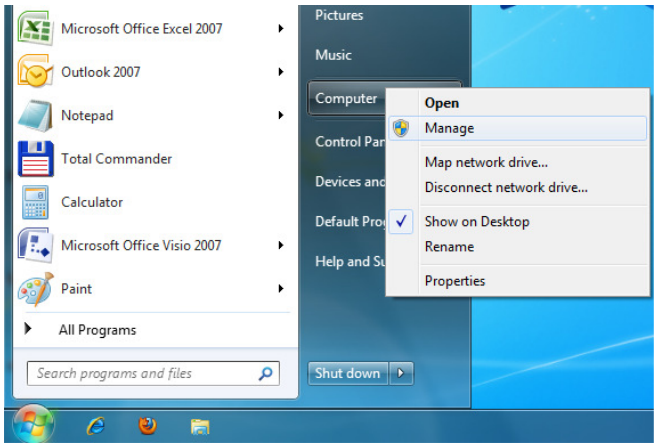
Run UDEC-1 Version x. xx.msi file.

Remember the installation path you will need at in step 2

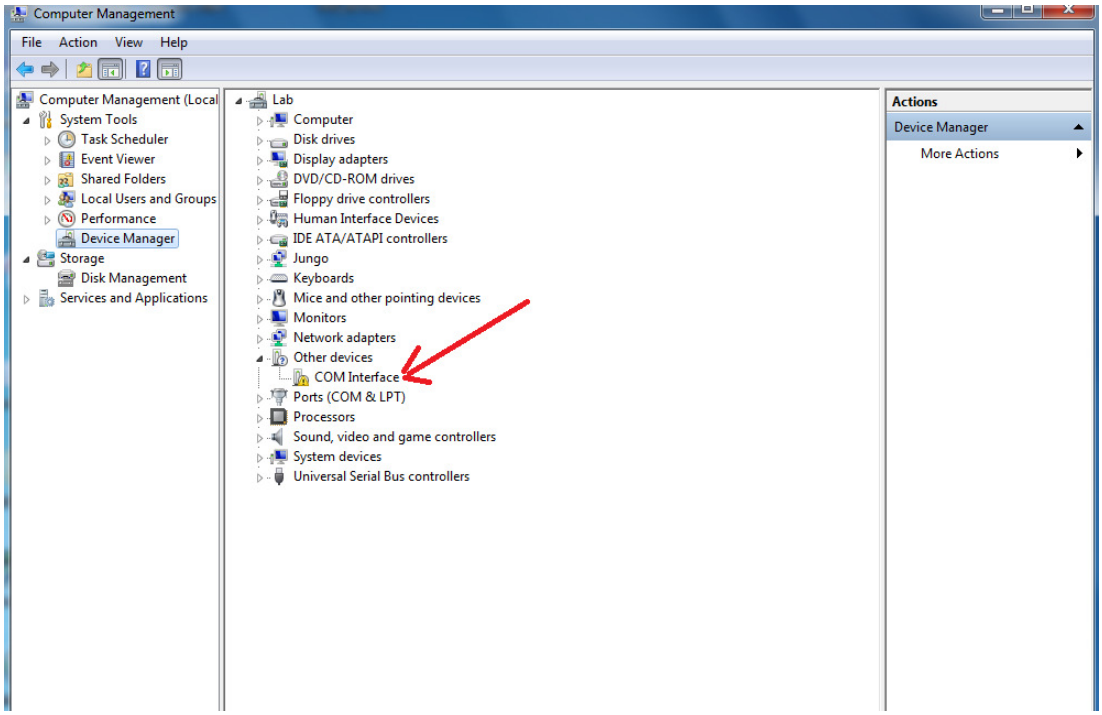

UDEC-1 Ver x.xx
Welcome to the UDEC-1 Ver x.xx Setup Wizard
ADCON
The installer will guide you through the steps required to install UDEC-1 Ver x.xx on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

Step 2: Updating the USB driver

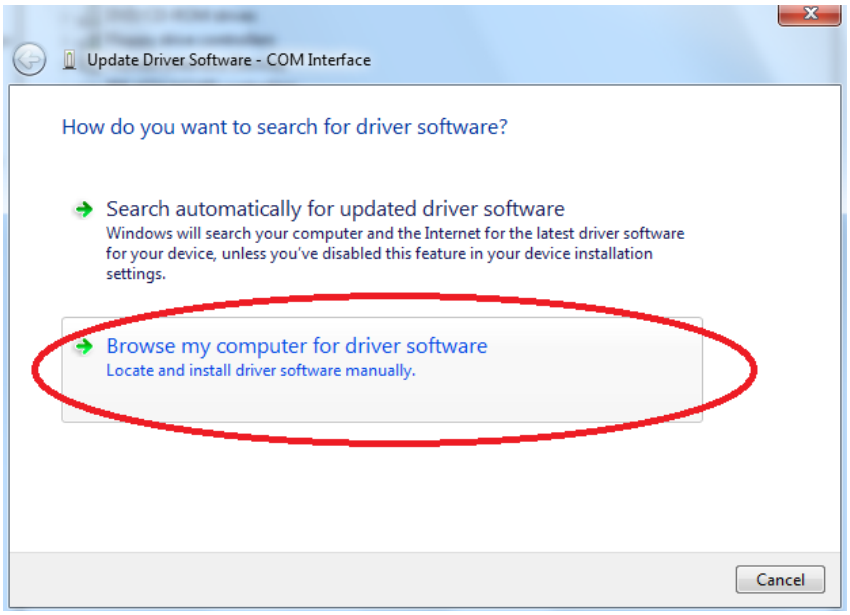
2.1 Verify UDEC-1 is connected to the USB
Go to "**start**", right click mouse button on "**Computer**" and click on "**Manage**".
(With windows XP right click on My Computer)



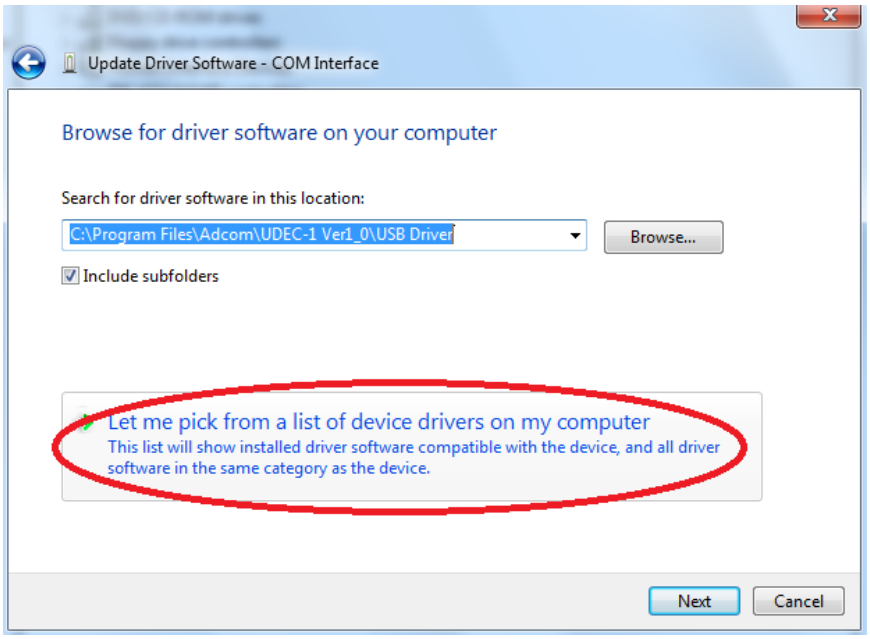
2.2. Go to *"***Device Manager***"*. Click right button on COM Interface and update driver software.



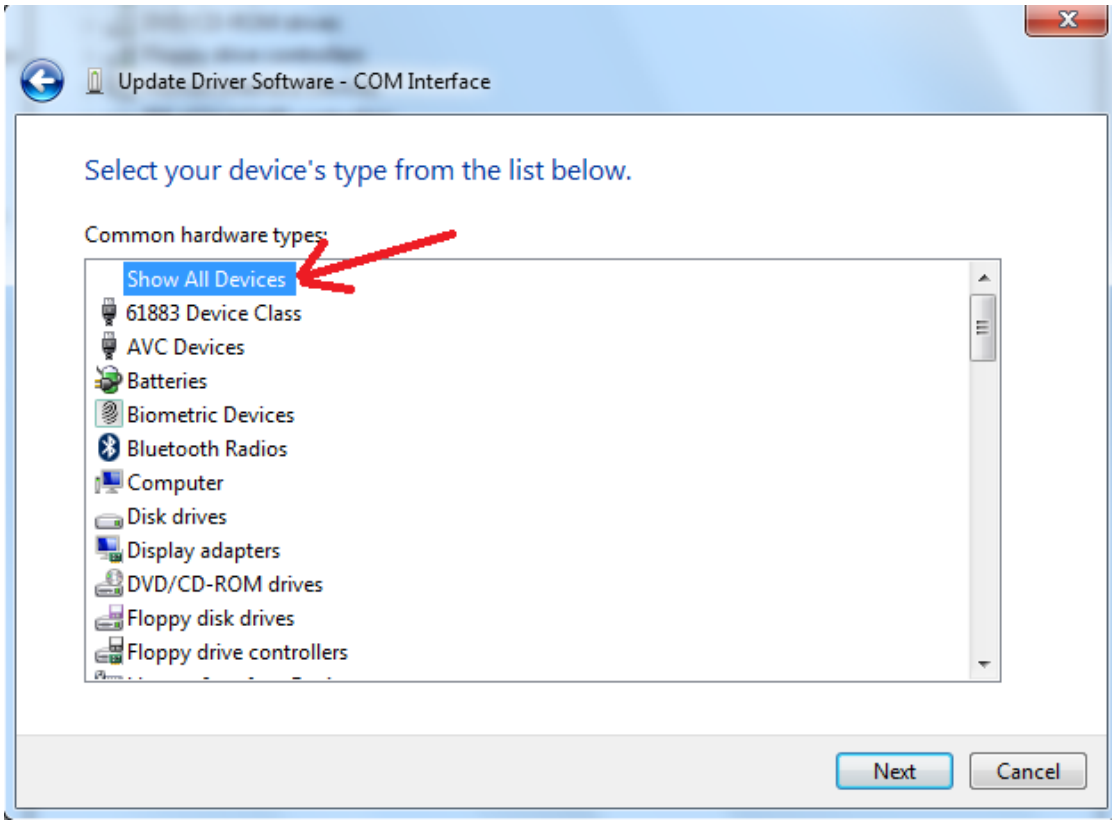
2.3. Select “**Browse my computer for driver software**”.
(With windows XP select “Install from a list or specific location”)


Update Driver Software - COM Interface
How do you want to search for driver software?
Search automatically for updated driver software
Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.
Browse my computer for driver software
Locate and install driver software manually.
Cancel

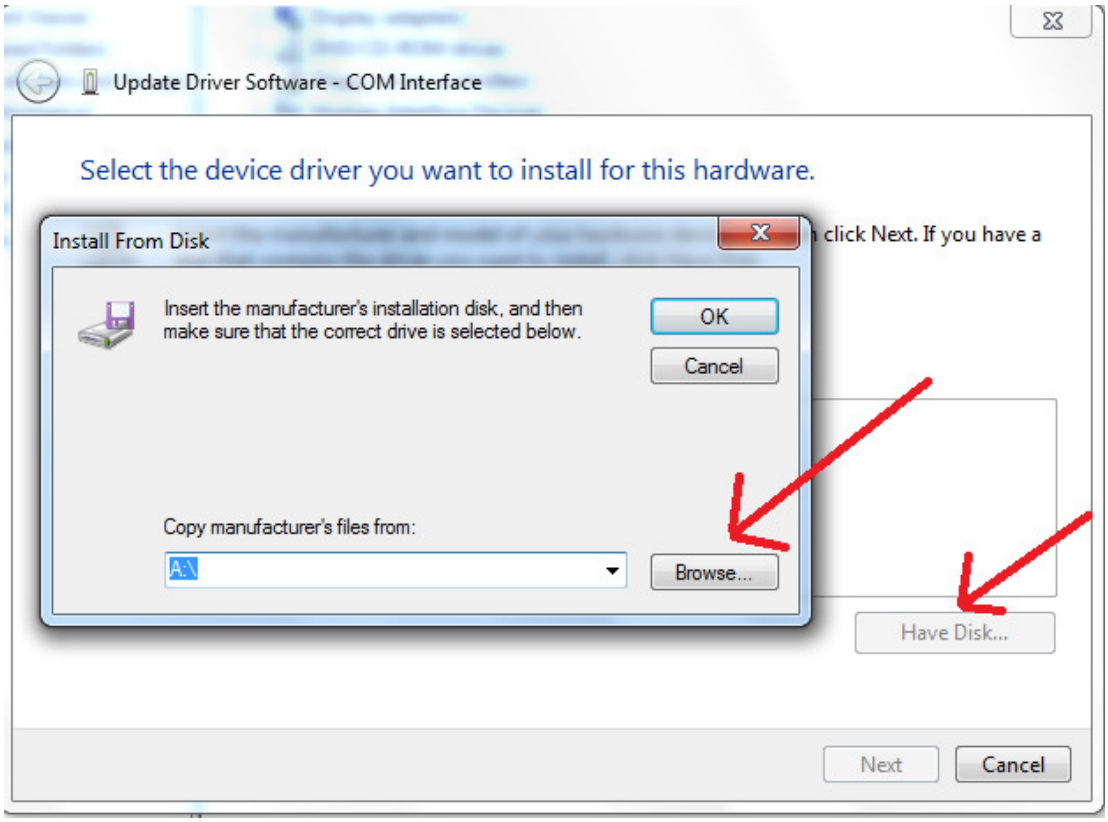
2.4. Select: “**Let me pick from a list of device drivers on my computer**”.
(With windows XP select don't search I will choose the driver to install)


Update Driver Software - COM Interface
Browse for driver software on your computer
Search for driver software in this location:
C:\Program Files\Adcom\UDEC-1 Ver1_0\USB Driver
Browse...
Include subfolders
Let me pick from a list of device drivers on my computer
This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
Next
Cancel

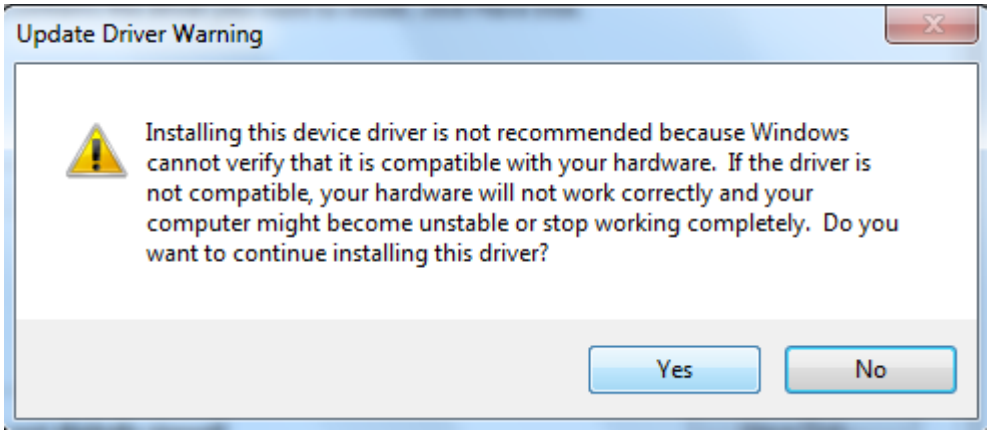
2.5. Select: “**Show All Devices**” and click Next.



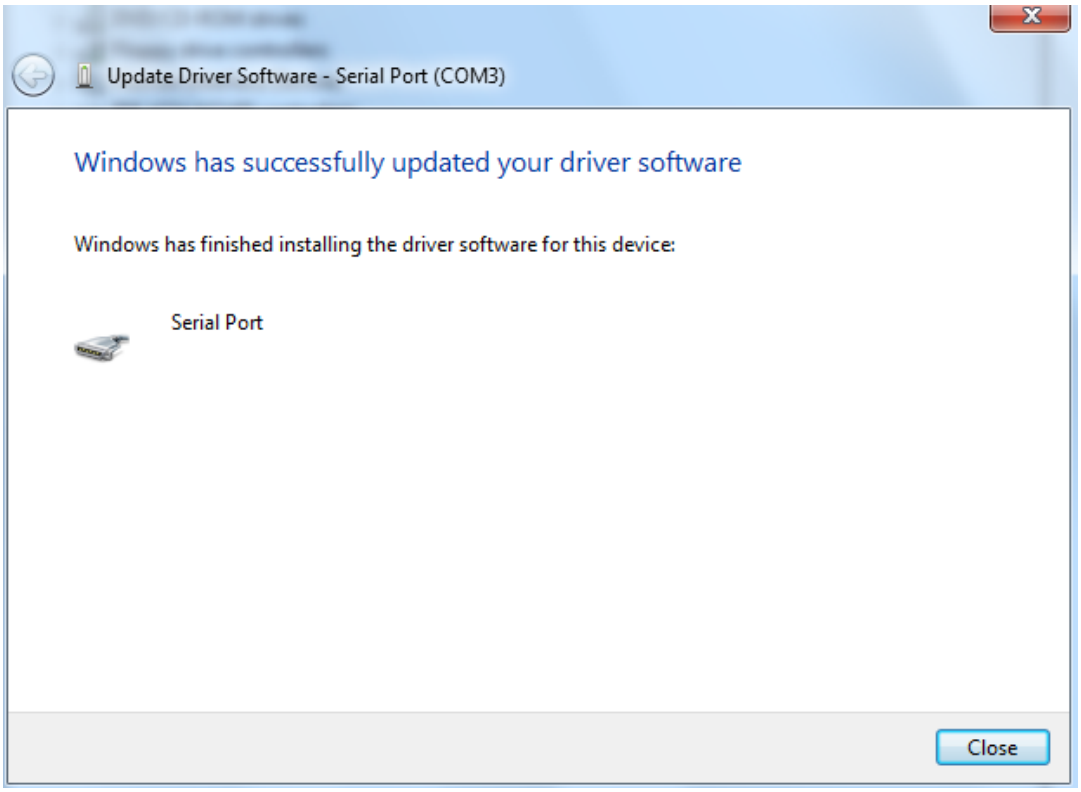
2.6. Select: "**Have Disk**" and select the installation path for the UDEC-1 as done in step 1 and click "**Next**".


Update Driver Software - COM Interface
Select the device driver you want to install for this hardware.
click Next. If you have a
Install From Disk
Insert the manufacturer's installation disk, and then make sure that the correct drive is selected below.
OK
Cancel
Copy manufacturer's files from:
A:\
Browse...
Have Disk...
Next
Cancel

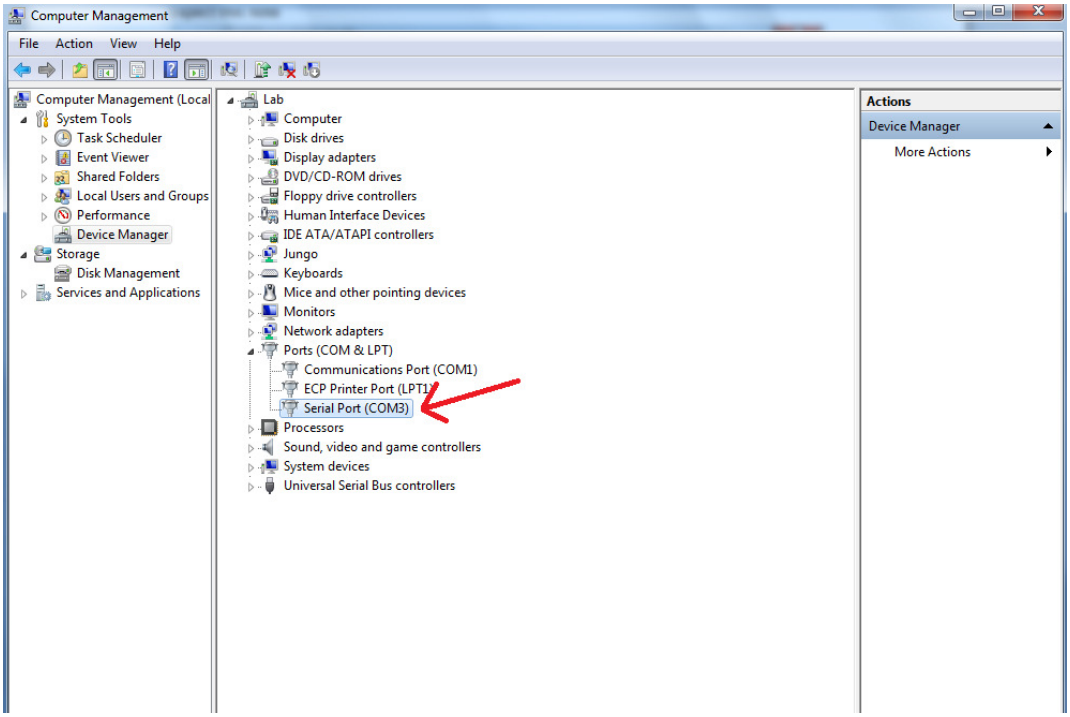
2.7. Select: "**Yes**" in the Update Driver Warning box.


Update Driver Warning
Installing this device driver is not recommended because Windows cannot verify that it is compatible with your hardware. If the driver is not compatible, your hardware will not work correctly and your computer might become unstable or stop working completely. Do you want to continue installing this driver?
Yes
No

2.8 . Expect this note


Update Driver Software - Serial Port (COM3)
Windows has successfully updated your driver software
Windows has finished installing the driver software for this device:
Serial Port
Close

2.9. Go back to "**Device Manager**" and make sure your driver is updated
Disconnect USB cable and connect it back.



End of installation